ITEM 72 FY95
04DS1
7 September 1993

PURCHASE DESCRIPTION

SYNTHESIZED SIGNAL GENERATOR (1 MHz to 2.5 GHz)

FSNSG-C

1.0 GENERAL This procurement requires a programmable synthesized signal generator covering a frequency range of 1 MHz to 2.5 GHz with AM/FM and high rate phase modulation capabilities.

2.0 CLASSIFICATION The synthesized signal generator described herein shall meet the requirements of MIL-T-28800( ), Type III, Class 5, Style E, Color R for the Navy shipboard, submarine, and shore applications, with the following exceptions:

a. The Electromagnetic Interference requirements of MIL-T-28800( ) are limited to CE01, CE03, CS01, CS02 (0.05 to 100 MHz), CS06, RE01 (relaxed 20 dB; back panel search excluded), RE02 (14 kHz to 10 GHz), and RS03.

b. The warm-up time is extended to 2 hours.

3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics

3.1.1 Frequency Range: At least 1 MHz to 2.50 GHz

3.1.2 Frequency Resolution: At least 1 Hz

3.1.3 Frequency Stability (CW mode)

3.1.3.1 Internal: At least $\pm 1 \times 10^{-9}$/day
3.1.3.2 External: Equal to external standard frequency stability

3.1.4 Spectral Purity (Level $\leq$ 0 dBm)

3.1.4.1 Harmonics/Sub-harmonics: At least -25 dBc
3.1.4.2 Non-Harmonics/Spurious: At least -70 dBc
3.1.4.3 Signal Sideband Phase Noise: $\leq$ -120dBc/Hz [10 kHz offset]

3.1.5 Reference Frequency

3.1.5.1 Internal Reference Oscillator: 10 MHz
3.1.5.2 External Reference Oscillator: 5 or 10 MHz

3.2 Output Characteristics

3.2.1 Range: +10 to -130 dBm

3.2.2 Accuracy: $\pm$1.5 dB [level > -120 dBm]

3.2.3 Flatness: $\pm$1.5 dB [at 10 dBm output]

3.3 Modulation Characteristics {F = carrier frequency L = carrier level}

3.3.1 Amplitude Modulation (AM) {L $\leq$ 0 dBm}

3.3.1.1 Internal
3.3.1.1.1 Rate: At least 400 Hz and 1 kHz $\pm$5%
3.3.1.1.2 Depth: At least 0 to 90%
3.3.1.1.3 Accuracy: $\pm$10% [@1 kHz]
3.3.1.1.4 Distortion: $\leq$ 5% [30% depth @1 kHz]

3.3.1.2	External	
3.3.1.2.1	Rate: At least 20 Hz to 10 kHz	[F ≥ 10 MHz]
3.3.1.2.2	Depth: At least 0 to 90%	
3.3.1.2.3	Accuracy: ±10%	[@1 kHz]
3.3.1.2.4	Distortion: ≤ 5%	[30% depth @ 1 kHz]
3.3.2	Frequency Modulation (FM) {ΔF = FM deviation}	
3.3.2.1	Internal	
3.3.2.1.1	Rate: At least 400 and 1 kHz ±5%	
3.3.2.1.2	Deviation: At least 0 to 150 kHz	[F > 640 MHz]
3.3.2.1.3	Accuracy: ±10% of ΔF setting	[1 kHz rate]
3.3.2.2	External	
3.3.2.2.1	Rate: At least dc to 100 kHz	
3.3.2.2.2	Deviation: At least 0 to 150 kHz	[F > 640 MHz]
3.3.2.1.3	Accuracy: ±10% of ΔF setting	[< 20 kHz rate]
3.3.2.2.3	Distortion: ≤ 3%	[ΔF = 50 kHz @ 10 kHz]
3.3.3	Phase Modulation (ØM)	
3.3.3.1	Internal	
3.3.3.1.1	Rate: At least 400 Hz and 1 kHz	
3.3.3.1.2	Deviation: At least 0 to ±100°	[F > 250 MHz]
3.3.3.1.3	Accuracy: ±10% of full scale	
3.3.3.1.4	Distortion: ≤ 10%	[Δø = 50° @ 1 kHz]
3.3.3.2	External	
3.3.3.2.1	Rate: dc to 1 MHz	[250 MHz < F < 2.5 GHz]
3.3.3.2.2	Deviation: At least 0 to ±100°	[F > 250 MHz]
3.3.3.2.3	Accuracy: ±10% of full scale	
3.3.3.2.4	Distortion: ≤ 10%	[Δø = 50° @ 100 kHz]

4.0 GENERAL REQUIREMENTS

4.1 Power: 115/230 Vac ±10%, single phase, 50, 60 or 400 Hz ±10%, 450 watts max

4.2 Lithium Batteries: Per MIL-T-28800, lithium batteries are prohibited without prior authorization. Requests for approving the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Dimensions: The total volume of the unit shall not exceed 49162 cm^3 (3000 in^3), with a maximum height of 7.25 in.

4.4 Weight: The total weight of the unit shall not exceed 30 kg (66 lb).

4.5 Calibration Interval: The calibration interval shall be 12 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor, following a calibration interval of 12 months.

4.6 Remote Programming: The generator shall be capable of being remotely controlled via the IEEE-488 interface bus, operating as both a talker and listener, having at least the following subset of bus functions: AH1, L4, SH1, T6, SR1, DC1, and RL1.